

WHAT IS CLAIMED IS:

1. A photothermographic material having, on a support, at least an image-forming layer containing a non-photosensitive silver salt, a photosensitive silver halide and a binder and a protective layer outer than the image-forming layer on the support, and the photothermographic material satisfies at least one of the following Conditions I and II:

Condition I

At least one of the layers formed on the image-forming layer side of the support contains at least one compound selected from compounds represented by the following formula (1), (2) or (3), and the NH_4^+ content in all the layers formed on the image-forming layer side of the support is 0.06 mmol/m^2 or less:



wherein:

in the formula (1), R^1 , R^2 and R^3 each independently represents a hydrogen atom or a substituent, Z represents an electron-withdrawing group, and R^1 and Z, R^2 and R^3 , R^1 and R^2 , or R^3 and Z may be combined with each other to form a ring structure,

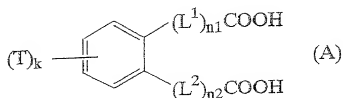
in the formula (2), R^4 represents a substituent,

in the formula (3), X and Y each independently represents a hydrogen atom or a substituent, A and B each independently represents an alkoxy group, an alkylthio group, an alkylamino group, an aryloxy group, an arylthio group, an anilino group, a heterocyclyloxy group, a heterocyclylthio group or a heterocyclylamino group, and X and Y or A and B may be combined with each other to form a ring structure:

Condition II

At least one of the layers formed on the image-forming layer side of the support contains a nucleating agent, and at

least one of the layers formed on the image-forming layer side of the support contains at least one compound represented by the following formula (A), and film surface pH of the image-forming layer side of the support is substantially unchanged:



wherein:

in the formula (A), T represents a monovalent substituent, k represents an integer of 0-4; when k is 2 or more, two or more of T may be the same or different from each other or one another and may be bonded together to form a ring; L^1 and L^2 each independently represents a bridging group; and $n1$ and $n2$ each independently represents an integer of 0-30.

2. The photothermographic material according to Claim 1, which satisfies Condition I.

3. The photothermographic material according to Claim 2, wherein the NH_4^+ content in all the layers formed on the image-forming layer side of the support is 0.03 mmol/m² or less.

4. The photothermographic material according to Claim 2, wherein, in the formula (1), Z represents a cyano group, a formyl group, an acyl group, an alkoxycarbonyl group, an imino group or a carbamoyl group, R^1 represents an electron-withdrawing group, and one of R^2 and R^3 represents a hydrogen atom and the other represents a hydroxyl group or a salt thereof, a mercapto group or a salt thereof, an alkoxy group, an aryloxy group, a heterocyclyloxy group, an alkylthio group, an arylthio group, a heterocyclylthio group, an amino group or a heterocyclic group.

5. The photothermographic material according to Claim 2, wherein, in the formula (1), Z and R¹ are combined with each other to form a non-aromatic 5- to 7-membered ring structure, and one of R² and R³ represents a hydrogen atom and the other represents a hydroxyl group or a salt thereof, a mercapto group or a salt thereof, an alkoxy group, an aryloxy group, a heterocyclyloxy group, an alkylthio group, an arylthio group, a heterocyclylthio group, an amino group or a heterocyclic group.

6. The photothermographic material according to Claim 2, wherein, in the formula (2), R⁴ represents a cyano group, an acyl group, a formyl group, an alkoxycarbonyl group, a carbamoyl group, a sulfamoyl group, an alkylsulfonyl group, an arylsulfonyl group, a sulfonamido group or a heterocyclic group.

7. The photothermographic material according to Claim 2, wherein, in the formula (3), X and Y are combined with each other to form a ring structure having a total carbon number of 1-35.

8. The photothermographic material according to Claim 2, wherein, in the formula (3), A and B are combined with each other to form a ring structure having a total carbon number of 3-30.

9. The photothermographic material according to Claim 1, which satisfies Condition II.

10. The photothermographic material according to Claim 9, wherein, in the formula (A), k is 0 or 1.

11. The photothermographic material according to Claim 9, wherein, in the formula (A), two or more of T are bonded to form [3,4]benzo, [4,5]benzo, [4,5]naphtho, [3,4]methylenedioxy or [4,5]methylenedioxy.

12. The photothermographic material according to Claim

9, wherein, in the formula (A), L^1 and L^2 each independently represents a bridging group of a length corresponding to 0-2 atoms and n1 and n2 each independently represents 0-6.

13. The photothermographic material according to Claim 12, wherein, in the formula (A), L^1 and L^2 each independently represents $-\text{CH}_2-$, $-\text{CH}_2\text{CH}_2-$, $-\text{C}(=\text{O})-$, $-\text{CONH}-$ or $-\text{SO}_2\text{NH}-$ and n1 and n2 each independently represents 0-2.

14. The photothermographic material according to Claim 9, wherein the film surface pH is 6.0 or less.

15. The photothermographic material according to Claim 14, wherein the film surface pH is 5.5 or less.

16. The photothermographic material according to Claim 1, which satisfies both of Conditions I and II.

17. The photothermographic material according to Claim 1, wherein at least one of the layers formed on the image-forming layer side of the support contains an acid formed by hydration of diphosphorus pentoxide or a salt thereof.

18. A method for forming images, which comprises a step of exposing the photothermographic material according to Claim 1 for a time of 10^{-6} second or less.

19. A method for forming images, which comprises a step of exposing the photothermographic material according to Claim 1 by a multibeam apparatus provided with two or more of laser heads.

20. A method for forming images, which comprises a step of developing the photothermographic material according to Claim 1 by heating at a line speed of 140 cm/min or more.